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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,202	12/14/2001	Barbara R. Evans	920976.90199	1198

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,202

Applicant(s)

EVANS ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This communication is being provided in reply to the amendment filed 12/14/04. The applicants has not overcome yet the 35 USC 103 rejection. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. Thus, the claims are finally rejected over the same art as seen below and for the reasons of record:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 12-14, 16 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshitake et al 6087032 in view of the WO 89/12107 publication.

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The present claims are directed to a fuel cell wherein the disclosed inventive concept comprises the use of bacterial cellulose therein. Other limitations include the platinum group catalyst; the metal salt and the sulfonated polymer.

With respect to claim 12:

Yoshitake et al disclose a fuel cell comprising a membrane electrode polymer, a fuel electrode disposed on one side of the electrolyte, and an air electrode disposed on the other side of the electrolyte (ABSTRACT) wherein the gas diffusion electrode constituting the fuel electrode and the air electrode is made of a gas diffusion electrode having a catalyst covered with a fluorocarbon ion exchange resin (ABSTRACT/ COL 2, lines 53-57). It is disclosed that the catalyst is made from a platinum group element (COL 6, lines 6-15/ EXAMPLES 1-3)

Yoshitake et al disclose that the catalyst being supported on a carrier (COL 2, lines 53-55). Thus, Yoshitake et al do encompass gas diffusion electrodes acting as carrier for supporting catalyst.

Examiner's note: *it is noted that the instant claims are being construed as product-by-process claims (i.e. the limitation "the metal catalyst being disposed in or on the electrode support structure by placing the electrode support structure in a solution of a metal salt for a sufficient time period such that the metal salt is reduced to metallic form and the metal catalyst precipitates in or on the electrode support structure"), therefore the product itself (viz. the electrode support structure of the fuel cell) does not depend on the process of making it.*

Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production. In that, it is further noted that the product in the instant claims is the same as or obvious over the product of the prior art. Therefore, the claims are obvious over the

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applied art above as it has been held similar products claimed in product-by-process limitations are obvious In re Brown 173 USPQ 685 and In re Fessman 180 USPQ 324 (Refer to MPEP 2113: Product-by-Process Claims). In this case, since the prior art teaches the electrode support structures having disposed thereon a metal catalyst material, the examiner has a reasonable basis to suspect that the claimed product and the combined prior art product (i.e. the electrode support structure per se) would be substantially the same.

With respect to claim 13-14 and 24:

It is disclosed that the catalyst is made from a platinum group element (COL 6, lines6-15/EXAMPLES 1-3)

With respect to claim 16:

It is disclosed the use of a fluorocarbon sulfonic acid type ion exchange resin as the ion exchange resin (COL 2, lines 61 to COL 3, line 3).

Yoshitake et al disclose a fuel cell according to the foregoing. However, Yoshitake et al do not disclose the specific anode/cathode material; and the specific membrane material.

As to claims 12 and 23:

The WO'107 publication teaches articles made from bacterial cellulose wherein the articles are useful for producing a variety of articles (ABSTRACT). It is disclosed that microbial cellulose, as a substitute for conventional cellulose and for applications in which conventional cellulose was not previously used, finds a variety of uses such as a specialty carrier, such as for fuel cells (page 3, lines 19-33). It is further disclosed that the same type of approach will make these gels useful in fuel cell and battery structure articles, where the electrolyte comprises the liquid phase of the microbial cellulose gel (page 17, lines 33-36). Thus, it is noted that the

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WO'107 publication does encompass the use of bacterial cellulose articles as both fuel cell electrolytes and specialty carriers. In this regard, it is further noted that gas diffusion electrodes (i.e. fuel electrodes and air electrodes) need to carry catalyst so as to provide the active area for carrying out the necessary electrochemical reaction for converting chemical energy into electrical energy. Thus, a fuel cell electrode is a catalyst carrier, that is, a structure adapted to support catalyst material.

The WO'107 publication further discloses that the cellulose membrane can be loaded with various features (page 18, lines 1-2). It has superior properties because of their self-supporting properties and characteristics (page 16, lines 31-32).

As to claims 21-22:

The WO'107 publication also teaches the use of dehydrated bacterial cellulose articles (page 30, lines 5-8).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific anode/cathode material (the specialty carrier) and membrane material of the WO'107 publication in the fuel cell of Yoshitake et al because the WO'107 publication enables those skilled in the art to use bacterial cellulose articles as specialty carriers and electrolyte membranes for fuel cells. In that, it is noted that the WO'107 publication makes clear that the resulting cellulose article has a large number or set of properties which can be collected and compiled for transposing microbial-produced cellulose microfibrils into compositions, articles, and structures having nonobvious properties, not previously known for cellulosic compositions. Thus, microbial cellulose, as a substitute for conventional cellulose and for applications in which conventional cellulose was not previously used, finds a variety of uses.

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Accordingly, the WO'107 publication clearly envisages the use of bacterial cellulose articles as specialty carrier and electrolyte membranes in fuel cells. Furthermore, since Yoshitake et al do encompass gas diffusion electrodes acting as carrier for supporting catalyst and the WO'107 publication does encompass the use of bacterial cellulose articles for both as fuel cell electrolytes as well as specialty carrier, it is impartially upheld and remarked that the cited references share the same field of endeavor and/or, at least, are reasonably pertinent to each other because they both address the same problem with which the inventor is currently concerned.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshitake et al 6087032 in view of the WO 89/12107 publication as applied to claim 1 above, and further in view of Westland et al 5207826.

Yoshitake et al'032 and the WO 89/12107 publication are argued, applied and incorporated herein for the reasons above. However, neither Yoshitake et al'032 nor the WO 89/12107 publication expressly disclose the metal salt on the membrane structure.

Westland et al reveals the use of base medium for use with cellulose producing microbial cultures (COL 6, lines 14-30) comprising metal salts (COL 6, lines 14-30); it is also taught coating metals on bacterial cellulose to produce materials having special electronic properties (COL 2, lines 56-68).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific metal salt on the membrane structure of Westland et al in the fuel cell membrane material of both Yoshitake et al'032 and the WO 89/12107 publication

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Because Westland et al teach that coating metals on bacterial cellulose is good for producing materials having special electronic properties. For instance, fuel cell electrodes and membranes are fuel cell components requiring special electronic properties. Thus, Westland et al's teachings encompass the use of metal-coated bacterial cellulose for electrical-related applications, which may include fuel cells for electrical power generation.

Response to Arguments

5. Applicant's arguments filed 12/14/04 have been fully considered but they are not persuasive. In addition, applicant's declaration under 37 CFR 1.132 dated 12/14/04 has also been considered in its entirety.

6. In this regard, it is noted that applicants have submitted the foregoing declaration to provide evidence that the claimed product is necessarily different from the prior art's product because the "*relatively slow growth of the metal particles using the method described in the present invention results in high crystallinity of the particles*". Upon careful review of applicant's declaration, it has been found that the specific method claimed by the applicant is a chemical deposition method that requires temperatures between ambient and 90°C (See item 5 of applicant's declaration). In contrast, applicant further declared that "*Conventional vapor deposition processes as in cited patents uses high temperatures to vaporize metallic metals and deposited them on surfaces in a vacuum chamber*" (See item 5 of applicant's declaration) and argued that "*The methods used by Yoshitake, WO'107 and Westland for the incorporation of metal particles can employ one of two process....(2) metal particles that deposited or epitaxially grown on the surface of the cellulose by vaporization of a metal*" (See the amendment dated

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12/14/04 paragraph bridging pages 4-5). In consequence, conventional vapor deposition processes also allow deposition of metal catalyst on the electrode structure comprised of bacterial cellulose. Alternatively, applicant's declaration further distinguishes both methods based on either: a) the chemical deposition using temperatures between ambient and 90°C, or b) the vapor deposition processes using high temperatures. However, the present claim language makes no further distinction as to what specific deposition method is ultimately intended. That is, it simply alludes to any deposition method per se wherein the metal catalyst is disposed in or on the electrode support structure to form metallic by having the metal catalyst precipitated in or on the electrode support structure. Having said that, it is noted that the broadest reasonable interpretation of the claim language still permits the instant claims to read on either the chemical deposition using temperatures between ambient and 90°C and/or the vapor deposition processes using high temperatures. Simply put, the claim language fails to positively set forth the specific deposition method, and therefore, the present claim language is not commensurate in scope of with the arguments presented in applicant's declaration. Therefore, applicant's declaration stating that the claimed product is necessarily different from the prior art's product is not appropriate and applicable. In this respect, the examiner likes to note that the validity of applicant's declaration and/or applicant's expertise/technical proficiency is in no way being disputed or challenged. The examiner acknowledges the competence of the declarant.

7. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a) "vapor deposition methods do not provide for effective deposition of metal in the internal pores of the electrode as in the present invention"; b) "the claimed invention allows for infusion of the metal

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salt into the pores of the cellulose”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

8. For a second time, it is noted that the present claims are still being construed as product-by-process claims. Thus, although applicants are entitled to define a product by using process/method limitations, what is given patentably consideration is the product itself (i.e. the electrode support structure per se) and not the manner in which the product was made. In this case, the prior art teaches the electrode support structures having disposed thereon a metal catalyst material. In consequence, the references are teaching substantially the same product and constituents as the product made by the method of the instant claims. Therefore, the patentability of a product is independent of how it was made. However, there may be situations when the manner in which a product was made should be given consideration. Thus, burden is on applicants to show differences in product-by-process claims as well as in product comparisons. Further, even though the prior art may fail to disclose other physical properties, in view of the substantially similar products being disclosed in the instant application, the examiner has a reasonable basis to suspect that the claimed product and the combined prior art product (i.e. the electrode support structure per se) would be substantially the same. Since PTO does not have proper equipment to carry out the analytical tests, the burden is then shifted to applicants to provide objective evidence demonstrating the claimed product is necessarily different from the prior art’s product, and that the difference is unobvious (*Refer to MPEP 2113: Product-by-Process Claims*).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to be 'RAYM', with a long horizontal flourish extending to the right.